

IN THE SPECIFICATION:

Page 8, line 24- page 9, line 33:

Figure 3 shows a first behavior of the ~~anode~~ cathode 2 in which the voltage applied by the bias source 5 is lower than a threshold value V_s from which an electron current can be measured. At this voltage value, an electric field F is applied which leads to a first lowering a_1 of the height of the surface potential barrier that results from the band being curved due to penetration of the electric field F and to a space charge Q being created by electrons being injected from the metal 7 into the semiconductor 8. A lowering a_2 is also obtained of the height of the surface potential barrier of the semiconductor because of the Schottky effect. It should be observed that the presence of the electric field F also leads to the surface potential barrier of the semiconductor 8 being deformed. In the example shown in Figure 3, the total lowering of the potential (a_1+a_2) of the surface potential barrier V_p of the semiconductor, as obtained by a given electric field corresponding to a voltage that is low and less than the threshold value V_s is not sufficient to allow electrons to be emitted. The surface potential barrier V_p is thus too high to enable electrons to be emitted into the vacuum 4. The electrons injected through the electron junction 9 are trapped inside the semiconductor 8. It must be assumed that the height of the surface potential barrier of the n-type semiconductor is greater than the level of the states occupied by the electrons in the semiconductor 8. Portion A of Figure 6 shows the curve of current I as a function of the potential V of the source 5, giving the current characteristic as obtained during this first stage of operation.

Figure 4 shows a second characteristic behavior of the

~~anode~~ cathode 2 for an applied bias voltage that is greater than the threshold voltage V_s . The electric field F created in this way is such that the height of the surface potential barrier V_p of the semiconductor 8 is substantially equal to the level of the states occupied by electrons in the semiconductor. The lowering (a_1+a_2) of the height of the surface potential barrier V_p of the semiconductor is then sufficient to enable electrons to escape by the tunnel effect. This produces an emission surface 11 having low electron affinity resulting from the presence of the space charge Q and the penetration of the electric field. The field emission current I shown in portion B of the curve of Figure 6 is governed by the Fowler Nordheim relationship characteristic of electron emission by the tunnel effect.

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There are numerous applications for the electron extraction device of the invention in the field of electronics, in particular for constituting a source for vacuum electronic components or for making flat screens. In the application of the invention for making flat screens, as shown in Fig. 11, provision can be made in conventional manner to implement a first electron extraction electrode (cathode) 2, which is placed close to ~~the~~ extraction anode 20 and allowing electron beams to pass of an intensity that is modulated locally for each pixel of the screen. These beams are picked up by a reception anode 22 placed downstream from the extraction anode relative to the emission cathode. It should be observed that by making the substrate 13 carrying the metal layer 7 out of a semiconductor material, it is possible to integrate active electronic components in the substrate for the purpose of locally controlling the emission of electrons.

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IN THE DRAWINGS:

Please add to the drawings Figure 11 as attached hereto.